

REMARKS

Claims 1 and 3-7 remain in the application with claims 1, 3, and 4 having been amended hereby.

Reconsideration is respectfully requested of the rejection of claims 1, 3, and 4 under 35 USC 103, as being unpatentable over Connor et al. in view of Matsuo and further in view of Yamada et al.

As explained in the present specification, the present invention is intended to provide a two-stage filtering system for headphones to improve the listening sense of audio signals played back over the headphones and to accommodate the multichannel audio programs that are now available relative to home theater applications. Furthermore, while it is known to provide filtering to improve listening over the headphones, in the past the filters were exceedingly long, that is, quite large circuit-wise and therefore were expensive. To solve this problem, the present invention provides a first filter that accepts n-channel audio signals and produces two output signals using filter stages of a predetermined number that are too short or have too few stages to include the reflective sound components. This is accomplished by using short filters and by mixing the signals in the various input channels so as to produce only the first and second channel signals. Thereafter, second filters are provided in which the signals are not mixed and which have a certain delay time that is intended to deal with the reflective sound components not dealt with in the first filter system. Furthermore, in the

second filter stage the two filters in that stage have different transfer functions to provide further localization of the sound signals.

The claims have been amended hereby to emphasize the above-noted features of the present invention.

Connor et al. relates to a system for providing some spatial location to telephone voices to enhance the ability to pay attention to different speakers during a conference call. The examiner points to the spatial processor shown in Fig. 4, where it will be immediately noted that there are no n-channel audio signals being processed. Clearly, Connor et al. relates to only a single input signal and, thus, the left and right response filters performing the head related transfer functions are operating on the same signal. Thus, there is no mixing of the n-channel input signals as in the present invention. Furthermore, in Connor et al. the processing in the second filters performing the reverberation processing is exactly the same, unlike the present invention.

Matsuo is cited for disclosing three-dimensional sound processing using FIR filters to provide reverberation. Nevertheless, Matsuo does not cure the deficiencies of Connor et al. as described hereinabove.

Yamada et al. is applied for its showing of signal processing for use in a headphone system. Nevertheless, Yamada et al. does not teach the features of the present invention wherein in the second pair of filters the transfer functions are different from each other, as taught by the

present invention and as recited in the amended claims.

Therefore, it is respectfully submitted that even combining the references as proposed by the examiner that the features of the present invention now set forth in the amended claims would not be present.

Reconsideration is respectfully requested of the rejection of claims 5-7 under 35 USC 103, as being unpatentable over Connor et al in view of Matsuo and further in view of Yamada et al. and further in view yet of Inanaga et al.

Claims 5-7 depend from claim 1, which for the reasons set forth hereinabove is thought to be patentably distinct over the cited references and, for at least those very same reasons, claims 5-7 are also submitted to be patentably distinct thereover.

Although Inanaga et al. shows the use of a gyroscope to determine an orientation or rotation of a headphone wearer's head, Inanaga et al. does not cure the deficiencies of primary reference Connor et al. relating to the features of the present invention now set forth in the amended claims.

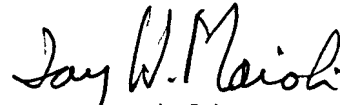
Accordingly, by reason of the amendments made to the claims hereby, as well as the above remarks, it is respectfully submitted that an audio processing apparatus for use with headphones that employs shorter filters than previously used, as taught by the present invention and as recited in the amended claims, is neither shown nor suggested in the cited references, alone or in combination.

Entry of this amendment is earnestly solicited and it is respectfully submitted that the amendment raises no new issues requiring further consideration and/or search, since all of the previously recited elements have now been defined more clearly.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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A handwritten signature in cursive script, reading "Jay H. Maioli".

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